

## CLAIMS

The claims defining our invention are as follows :

- 1) A thin diaphragm of elongated two (binary ) interlaced coil electroacoustic transducer for use as loudspeaker, characterized by field replaceable sound emitting diaphragm without the need to manipulate wires and comprising :
  - a) A magnetic system which comprises an upper plate pole, 1 the two side poles 4 the central pole 3 and the row of Neodymium magnet bars 5 .Two air gaps 22 formed between the upper plate pole and central pole. The magnetic lines transversing the gap, create a high density field .
  - b) A thin foil diaphragm carrying thin aluminum conductors formatting at least one binary interlaced coil, 11 and 12, built the one into each other, and which are situated substantially in the plane of the magnetic lines transversing the air gap 22 and the conductors of the diaphragm, being crossed by the same intensity of flux lines perpendicularly , at the totality of their length, where, the application of  $F=BLi$  gives the same force F.
  - c) A diaphragm sound emitting assembly , 2 comprising a frame made of non-ferrous sheet metal, on which is tensioned a vibratable very thin diaphragm 2A of high temperature polymer on which are formatted a multiplicity of two elongated coils 11 and 12 of aluminum foil, which are identical and symmetrical., interlaced the one into the other.
- 2) A thin diaphragm electroacoustic transducer as claimed in claim 1, in which the said diaphragm is carrying a double coil 2A configuration, is adhered along the periphery of the frame and the elongated conductors of the two coils are terminated in two aluminium foil conducting islands, 9-9A and 10-10A each are symmetrically located at the extremities of the said diaphragm assembly 2.
- 3) A diaphragmatic electroacoustic transducer as claimed in claim 2, in which the said conducting islands, when the diaphragm assembly 2 is properly inserted inside the transducer, are situated in the routing or path of pair of contacts 13B and 13C which are spring loaded, and supported on the sliding covers 8 , thus at the end of the sliding route of each cover, two spring loaded contacts are pressed against the two mating conducting islands 9-9A and 10-10A .

- 4) A diaphragmatic electroacoustic transducer as claimed in claim 3 in which spring loaded contacts **13B** and **13C** are gold plated at their tip and soldered on the sliding cross shaped contact carrier **13**, which is made of copper laminated Bakelite sheet.
- 5) A diaphragmatic electroacoustic transducer as claimed in claim 4 in which the copper laminated sheet is separated in two conducting surfaces **13A** one for each contact. The one end of the cross, shaped contact carrier **13**, are soldered two flexible conductors of which their other end are soldered on the riveting member of the loudspeaker terminal.
- 6) A diaphragmatic electroacoustic transducer as claimed in claim 5 in which when the diaphragm assembly **2** is to be replaced, by removing the two transducer covers **8**, the diaphragm assembly is free to be withdrawn.
- 7) A diaphragmatic electroacoustic transducer as claimed in claim 6, in which the new diaphragm **2** is inserted, and the connecting of the two coils **11** and **12** with the corresponding terminals **16**, is accomplished simply by reclosing the transducer's upper and lower covers. This reclosing action, by the covers **8**, automatically terminates the one coil on the upper terminals and the other on the lower terminals **16**.
- 8) A diaphragmatic electroacoustic transducer as claimed in claim 7, in which the replaceable diaphragm and frame integral unit **2**, provides another advantage, which relates with the percentage of its area being actively driven by the audio signal. The two semicircular sections of the coils are free to vibrate, and the audio current flowing in that semicircular section of each coil is actively contributing in the sound producing process, in the same procedure as the linear sections of the coil, thus substantially increasing the transducer efficiency.
- 9) A diaphragmatic electroacoustic transducer as claimed in claim 8, in which the central pole **3** profile cut, shape, which resembles a dry river **23** with its two banks **21**, and reduces the number of useful magnetic lines crossing the center part of the diaphragm which is empty of conductors. The reduced lines from departing the bed of the river, are added to those crossing usefully the active gap **22** area and crossing the coils' conductors.
- 10) A diaphragmatic electroacoustic transducer as claimed in claim 9 in which the shape of central pole, where its upper part groove, serves also the purpose of accepting an elongated soft material that overflows the groove which acts as bumper for the diaphragm, during high amplitude excursions.
- 11) A diaphragmatic electroacoustic transducer as claimed in claim 10, in which the binary interlaced coils **11-12** of its diaphragm, can be utilized in a number of modes, by

those skilled in the art of sound reproduction: a) In series connection for increased sensitivity, b) in parallel connection for increased electrical power handling ability, c) furthermore for developing such applications as crossover in two different frequencies, d) DDL Direct Digital Loudspeaker, e) feedback optimizer circuitry, f) magnetic  
5 damping circuitry, h) two winding push-pull configuration, h) other inventive applications.